



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/733,077	12/11/2003	Hsin-An Wu	251705-1080	8468
24504	7590	03/07/2005	EXAMINER	
THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP 100 GALLERIA PARKWAY, NW STE 1750 ATLANTA, GA 30339-5948			DEB, ANJAN K	
			ART UNIT	PAPER NUMBER
			2858	

DATE MAILED: 03/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/733,077

Applicant(s)

WU, HSIN-AN

Examiner

Anjan K. Deb

Art Unit

2858

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 December 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>07/14/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1,2, 4-6, 12-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Hayashi (US 3,875,501).

Re claim 1, Hayashi discloses analog signal measuring device (Fig. 1) for measuring analog signal (e_i), comprising a digital controller comprising a pulse width modulation (PWM) controller (see Title) for outputting a pulse signal, a counter (M) and waveform converter, coupled to the PWM controller, for generating and outputting (S) a carrier signal according to the pulse signal, a comparator (H), coupled to the waveform converter (S) and the counter (M), for comparing the carrier signal (E6) to the analog signal (E10), and then generating a comparison pulse signal (E7), which enables the counter (M) to start counting and to generate a count value (D), wherein the digital controller gets a measured value (D) of the analog signal according to the count value (column 3 lines 25-44).

Re claim 2, Hayashi disclose the analog signal is inversely proportional (output E10 decreases in time t_1 , see Fig. 2a,2b) to a duty cycle of the comparison pulse signal (column 3 lines 25-44).

Re claim 4, Hayashi disclose analog signal is a DC voltage (see battery E, Fig. 1).

Re claim 5, Hayashi disclose waveform converter comprises an RC circuit (Fig. 1).

Re claim 6, Hayashi disclose waveform converter comprises a triangle wave generating circuit (S). Sawtooth generator has been broadly interpreted as triangle wave.

Re claim 12, Hayashi discloses analog signal measuring method utilizing a digital controller having a counter to measure an analog signal, the analog signal measuring method comprising the steps of generating (S) a carrier signal according to a pulse signal, comparing (H) carrier signal to analog signal and generating comparison pulse signal (E7), and enabling counter (M) to start counting and to generate (M) a count value (D) according to the comparison pulse signal, and getting a measured value of the analog signal according to the count value (D) (column 3 lines 25-44).

Re claims 13,14, Hayashi discloses the carrier signal is a sawtooth wave wave. Sawtooth generator has been broadly interpreted as triangle wave.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2858

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3, 7-11, 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Hayashi (US 3,875,501) in view of Katagiri (US 5,355,136).

Re claims 3,7-11, 15-19 Hayashi did not expressly disclose comparison pulse signal having a positive edge for enabling the counter to start counting, and a negative edge for disabling the counter from counting, and interrupt controller for enabling and disabling the counter.

Katagiri discloses positive edge for enabling the counter 31 to start counting, and a negative edge (trailing edge) for disabling the counter and interrupt controller (MICROPROCESSOR) for enabling and disabling the counter (column 5 lines 12-26)(Fig. 2).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Hayashi by adding interrupt controller disclosed by Katagiri having positive edge for enabling the counter to start counting, and a negative edge (trailing edge) for disabling the counter as disclosed by Katagiri for starting and stopping counter for measuring a count value indicative of pulse width for accurately measuring analog signal (voltage).

Re claim 8, Hayashi disclose analog signal is directly proportional to a duty cycle of the comparison pulse signal (output E10 increases in time t2)(Fig. 2a,2b), (column 3 lines 25-44).

Art Unit: 2858

Re claim 10, Hayashi disclose analog signal is inversely proportional (output E10 decreases in time t1, see Fig. 2a,2b) to a duty cycle of the comparison pulse signal (column 3 lines 25-44).

Re claim 11, Hayashi discloses analog signal is a DC voltage (see battery, E, Fig. 1).

Re claim 15, Hayashi discloses determining a pulse width of the pulse signal according to low-voltage level (E10 less than E6), and generating the carrier signal according to the pulse signal (column 3 lines 25-34).

Re claim 17, Hayashi discloses the carrier signal is a triangle wave. Sawtooth generator (Fig. 1) has been broadly interpreted as triangle wave.

Re claim 18, Hayashi discloses the analog signal is a DC voltage (see battery, E, Fig. 1).

Re claim 19, Hayashi discloses the steps of determining a pulse width of the pulse signal according to a low-voltage level (E10 less than E6),, and generating the carrier signal according to the pulse signal (column 3 lines 25-34).

Conclusion

5 . The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Weimer (US 4,362,988) discloses measuring an analog signal comprising RC network and counter.

Dorsman (US 4,112,428) discloses analog to digital converter system comprising pulse width modulation, triangular wave generator, and digital counter.

Tavernetti (US 5,745,062) discloses pulse width modulation analog to digital converter providing a pulse width modulation output signal having a pulse duration indicating amplitude of the input signal wherein the pulse duration is inversely proportional to the input signal amplitude.

Art Unit: 2858

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Anjan K. Deb whose telephone number is 571-272-2228. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lefkowitz Edwards can be reached at 571-272-2180.



Anjan K. Deb

Patent Examiner

Art Unit: 2858

3/3/05

Tel: 571-272-2228

Fax: 571-273-2228

E-mail : anjan.deb@uspto.gov